Space Weather Forecast

Issued on Monday, 10 October 2022 at 13:35 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares.
Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low to Moderate over the past 24 hours, with recorded X-ray activity confined to Common or low Moderate class. The largest flare of the period was from the largest and nominally most complex region on the disc in the northwest. This type of slow-burn flare has been typical of this sunspot group in recent days, with its apparent complexity not yet borne out in activity. There are five numbered sunspot groups on the disc. The region in the northwest remains the largest and most complex group, with a some magnetic complexity. A region in the northeast saw minor growth with some magnetic complexity developing. Other spots showed little change. Around 09/2300 UTC a filament eruption was seen from the southeast quadrant, this has been analysed as having the potential for an Earth directed component and we await model data for assessment. Finally, during the early hours a dimming was detected in imagery in the central southwestern quadrant, possibly related to a filament lift off. Imagery remains inconclusive as to if any Coronal Mass Ejection (CME) has resulted or if the filament was re-absorbed, but this will be monitored.
Solar Wind / Geomagnetic Activity: The solar wind was generally Elevated to Strong under coronal hole influences, with a rising trend being evident until around the middle of the period followed by a slow decline with values reducing to Slightly Elevated at times by the end of the period. The solar wind speed was around 570km/s to start the period, with brief peaks 630km/s overnight before an easing back to current level, around 530km/s. The Interplanetary Magnetic Field was within its typical weak background range. The north-south component was small-scale but mainly anti-aligned with Earth's field. Geomagnetic activity was Quiet to Active, peaking with a Kp 4 in the 10/2100-2400 UTC interval
Energetic Particles / Solar Radiation: No solar radiation storms were observed.
Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is forecast to be Low to Moderate initially. This looks to reduce somewhat into the period as current sunspots look to simplify slightly, but with Moderate still possible particularly as one or more active regions likely rotates over the eastern limb onto the visible disk. The degree to which this new areas manifests will be determined as and when any regions arrive. None of the more noteworthy groups on the disc leave the western limb in the next four days.
Solar Wind / Geomagnetic Activity: There are no major Earth-directed CMEs in the forecast, however the 07/0730UTC filament eruption CME may pass close to the Earth overnight UTC 11 into 12 October, giving some very slight peripheral influences. The 09/2300 UTC filament eruption from the southeast quadrant has been analysed as having the potential for an Earth directed component, with provisional assessment giving the risk of a glancing hit early on the 14th. Otherwise, ongoing fast winds are likely to gradually ease through the start of the period, likely approaching background by midweek UTC (12 October). Some enhancement is possible at times due to possible glancing CME effects. Largely Quiet to Unsettled but with a risk of Active intervals day 1 in association with ongoing fast wind activity and later in the period in association with possible glancing CME impacts.
Energetic Particles / Solar Radiation: Solar radiation storms should be at background, but with a daily slight chance of rising in response to any large x-ray flares, primarily from the largest

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sunspot groups.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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